

REMARKS

Applicants first wish to withdraw an inadvertent misstatement from the Amendment Under 37 C.F.R. § 1.114 and Remarks filed together with the Request for Continued Examination (RCE) on June 19, 2003. The misstatement appears in lines 1-2 on page 3 of the Amendment Under 37 C.F.R. § 1.114 and Remarks. In particular, Applicants stated by mistake that “[u]pon entry of the Amendment, claims 13-16 are pending.” On the Summary sheet of the outstanding Office Action, the Examiner also stated that claims 13-16 are pending in the application. Applicants note that, at the time of filing the Amendment Under 37 C.F.R. § 1.114 and Remarks, claims 1-20 were pending, with claims 1-12 and 17-20 being withdrawn from consideration. In any event, in the outstanding Office Action, the Examiner examined claims 13-16 on the merits.

By the present Amendment, Applicants have amended claim 9 to correct a typographical error. Applicants have also amended claim 13 to more appropriately define aspects of their invention, and added new claims 21-22 to protect additional aspects thereof. This Amendment is fully supported by the specification. See, for example, page 20, line 16 - page 21, line 4 of the specification. Therefore, no new matter has been added. Upon entry of the Amendment, claims 1-22 are pending, with claims 1-12 and 17-20 withdrawn from consideration as drawn to non-elected inventions.

In the Office Action, the Examiner rejected claims 13-14 under 35 U.S.C. §103(a) as unpatentable over Kobayashi (U.S. Patent No. 5,351,872), in view of Yamanaka (U.S. Patent No. 5,641,714) and Sumi et al. (U.S. Patent No. 5,110, 393); and rejected claims 15-16 under 35 U.S.C. §103(a) as unpatentable over Kobayashi in view of

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Yamanaka and Sumi et al., and further in view of Satoh (U.S. Patent No. 6,338,980), or Ohuchi (U.S. Patent No. 6,107,164), or Riding et al. (U.S. Patent No. 6,083,811).

Applicants respectfully traverse the rejections under 35 U.S.C. § 103(a), because a *prima facie* case of obviousness has not been established by the Examiner.

To establish a *prima facie* case of obviousness under 35 U.S.C. §103(a), each of three requirements must be met. First, the reference or references, taken alone or combined, must teach or suggest each and every element recited in the claims. Second, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to combine the references in a manner resulting in the claimed invention. Third, a reasonable expectation of success must exist. Moreover, each of the three requirements must "be found in the prior art, and not be based on applicant's disclosure." See M.P.E.P. §2143, 8th ed., February 2003.

Regarding the rejection of claims 13 and 14 under 35 U.S.C. § 103(a), Applicants submit that the applied references fail to teach or suggest each and every element of the claimed invention.

The present invention is related to a semiconductor packaging technique. Particularly, independent claim 13 recites a method of manufacturing a semiconductor device that includes, *inter alia*, "repeating a step of peeling a chip off the adhesive tape to sequentially peel the chips off the adhesive tape, wherein the step of peeling a chip off the adhesive tape comprises: blowing inert gas at a high temperature to the adhesive tape so as to decrease adhesion of the adhesive tape; thrusting the chip using pins from a back side of the adhesive tape with the adhesive tape between the chip and

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the pins, and keeping the pins at a peak position for an amount of time in the range of 0.01 to 10 seconds to facilitate peeling the chip off the adhesive tape, wherein the pins do not pierce the adhesive tape."

As Applicants noted in the Request for Reconsideration filed on March 19, 2003, "Kobayashi only discloses the movements of collet 12. See Kobayashi, col. 8, line 27-col. 10, line 12. In regard to the push-up needles 31, which the Examiner alleges . . . correspond to Applicants' claimed pins, Applicants submit that, besides [the teaching] that 'the push-up needles 31 are moved upward' (col. 8, lines 47-49), Kobayashi does not disclose any other movement thereof in its disclosure or claims whatsoever." Request for Reconsideration filed on March 19, 2003, page 3. In other words, Kobayashi fails to teach or suggest at least "keeping the pins at a peak position for an amount of time in the range of 0.01 to 10 seconds to facilitate peeling the chip off the adhesive tape," as recited in claim 13.

On page 2 of the Office Action, the Examiner alleged that "the pins of Kobayashi must be in the raised position for at least an instant before it descends away from the chip (5, 1+)." Applicants respectfully traverse the Examiner's allegation for the following reasons.

According to Kobayashi, "the push-up needles 31 . . . and the collet 12 are moved upward simultaneously by a distance c in accordance with the uniform motion as shown by C₄ in FIG. 8 (c). Further, the vacuum equipment . . . connected to the pipe 34 is actuated to evacuate the pipe 34, with the result that the semiconductor die 2 pushed up by the push-up needles 31 is sucked by the collet 12 securely. . . . Thereafter, the collet 12 is moved upward to the original point in accordance with the uniformly

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accelerated and decelerated motion as shown by C₅ in FIG. [8](c)." Kobayashi, col. 8, line 47 – col. 9, line 9. Referring to Fig. 8(c), which shows the change of the position of collet 12 with time, apparently, collet 12 is constantly in motion during segments C₄ and C₅. Since "the semiconductor die 2 . . . is sucked by the collet 12 securely," semiconductor die 2 is also constantly in motion with collet 12 during segments C₄ and C₅ of Fig. 8(c). In other words, even if the push-up needles 31, alleged by the Examiner as corresponding to Applicants' claimed pins, remain "in the raised position for at least an instant," as alleged by the Examiner, such an instant does NOT, and CANNOT, serve the purpose of "[facilitating] peeling the chip off the adhesive tape," because the chip is already "sucked by the collet 12 securely", and is constantly in motion together with collet 12. Therefore, Kobayashi actually teaches away from claim 13, which recites, *inter alia*, "keeping the pins at a peak position for an amount of time in the range of 0.01 to 10 seconds to facilitate peeling the chip off the adhesive tape."

Moreover, Applicants argued, both in the Request for Reconsideration filed on March 19, 2003, and in the Amendment Under 37 C.F.R. § 1.114 and Remarks filed on June 19, 2003, that Kobayashi fails to teach or suggest at least "wherein the pins do not pierce the adhesive tape," as recited in claim 13. In response, the Examiner alleged that Kobayashi's Fig. 3 teaches the feature. Office Action, page 3. Applicants respectfully disagree.

Kobayashi describes a die bonding apparatus as shown in Fig. 3, and the movements of push-up needles 31 and collet 12 as shown in Figs. 5(a)-5(c), 6(a)-6(c), 7, and 8(a)-8(d). As discussed above, Kobayashi's push-up needles 31 move during the operation of the die bonding apparatus. However, at most, Fig. 3 only teaches the

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position of push-up needles 31 at an instant of time. Kobayashi fails to indicate the status of the die bonding apparatus or that of push-up needles 31 as shown in Fig. 3. Therefore, it is improper and impossible to infer whether push-up needles 31, allegedly corresponding to Applicants' claimed pins, would pierce the adhesive tape, from the disclosure of Fig. 3, which only depicts an instant status of the die bonding apparatus. In addition, as the Examiner correctly recognized in the Office Action, Kobayashi does "not specifically teach 'wherein the pins do not pierce the adhesive tape'." Office Action, page 3. Therefore, Kobayashi also fails to teach or suggest at least "wherein the pins do not pierce the adhesive tape," as recited in claim 13.

Further, Yamanaka teaches a method of manufacturing a plurality of members on a single substrate and cutting the substrate in such a manner as to be divided into individual members. Sumi et al. teaches an apparatus for bonding a multi-layer thin film onto a substrate. Neither Yamanaka nor Sumi et al. teaches or suggests at least "keeping the pins at a peak position for an amount of time in the range of 0.01 to 10 seconds to facilitate peeling the chip off the adhesive tape, wherein the pins do not pierce the adhesive tape". Therefore, neither Yamanaka nor Sumi et al. overcomes the deficiencies of Kobayashi.

Finally, as the Examiner correctly recognized in the Office Action, neither Kobayashi nor Yamanaka teaches or suggests at least "blowing inert gas at a high temperature to the adhesive tape so as to decrease adhesion of the adhesive tape," as recited in claim 13. Office Action, page 4. However, the Examiner alleged that "Sumi teaches . . . using a pressurized gas which can be either air or an inert gas (4, 36+)." Office Action, page 5. Applicants respectfully point out that, contrary to the Examiner's

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allegation, Sumi et al. does not teach “using a pressurized gas.” Instead, Sumi et al. teaches using “a pressurized **fluid** such as gas (e.g., air, inert gas) and liquid (e.g., water).” Sumi et al., col. 4, line 36-37, emphasis added. Clearly, a pressurized fluid is not equivalent to an “inert gas,” as recited in claim 13. Therefore, none of Kobayashi, Yamanaka, and Sumi et al. teaches or suggests at least “blowing inert gas at a high temperature to the adhesive tape so as to decrease adhesion of the adhesive tape,” as recited in claim 13.

In view of the above, Kobayashi, Yamanaka, and Sumi et al., taken alone or in combination, fail to teach or suggest each and every element of the present invention as claimed in claim 13. They actually teach away from the claimed invention. One skilled in the art would have not been motivated to combine these references to result in the present invention. Nor would there be any reasonable expectation of success in doing so, in view of such teaching-away references. Therefore, claim 13 is patentable over Kobayashi, Yamanaka, and Sumi et al..

Claim 14, which depends from claim 13, is therefore also patentable over Kobayashi, Yamanaka, and Sumi et al., at least because of its dependency from an allowable base claim.

Applicants further respectfully traverse the rejection of claims 15 and 16 under 35 U.S.C. § 103(a).

First, as discussed above, Kobayashi, Yamanaka, and Sumi et al., taken alone or in combination, fail to teach or suggest each and every element of claim 13, from which claims 15 and 16 depend. They actually teach away from claim 13.

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Additionally, Applicants submit that Satoh appears to disclose a chip-scale package manufacturing method; Ohuchi appears to disclose a method of manufacturing a semiconductor device; and Riding et al. appears to teach a method for producing a thin dice from fragile materials. None of these references teaches a method of peeling a chip off an adhesive tape, or at least the features of "blowing inert gas at a high temperature to the adhesive tape so as to decrease adhesion of the adhesive tape; . . . and keeping the pins at a peak position for an amount of time in the range of 0.01 to 10 seconds to facilitate peeling the chip off the adhesive tape, wherein the pins do not pierce the adhesive tape," as recited in claim 13. Therefore, none of Satoh, Ohuchi, and Riding et al. overcomes the above-mentioned deficiencies of Kobayashi, Yamanaka, and Sumi et al. As a result, claim 13 is patentable over Kobayashi, Yamanaka, and Sumi et al., further in view of Satoh, Ohuchi, and Riding et al. Claims 15 and 16, which depend from claim 13, are also patentable at least because of dependency from an allowable base claim.

On page 6 of the Office Action, the Examiner also alleged that, regarding claim 15, "[i]t would have been obvious to one of ordinary skill in the art at the time of the invention to use the inventions of Satoh, Ohuchi and Riding in the combined inventions of Kobayashi, Yamanaka and Sumi," and that, regarding claim 16, "[o]ne of ordinary skill in the art at the time of the invention would know that it is important to treat the chips especially with thin chips, carefully so as to prevent damages being done to the chip." Applicants respectfully traverse these allegations. The Federal Circuit has repeatedly stated that "there is no basis for concluding that an invention would have been obvious solely because it is a combination of elements that were known in the art at the time of

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the invention. Instead, the relevant inquiry is whether there is a reason, suggestion, or motivation in the prior art that would lead one of ordinary skill in the art to combine the references, and that would also suggest a reasonable likelihood of success." *Smiths Industries, Medical Sys., Inc. v. Vital Signs, Inc.*, 183 F.3d 1347, 1356, 51 USPQ2d 1415, 1420 (Fed. Cir. 1999).

Regarding claim 15, which recites, *inter alia*, "forming a half cut groove on an element forming face of the wafer along one of a dicing line and a chip separation line such that the groove does not penetrate through to a back side of the wafer, and then grinding the back side of the wafer to separate the chips," Applicants submit that Kobayashi, Yamanaka, and Sumi et al. clearly lack such a reason, suggestion, or motivation, because *a*) these references fail to teach or suggests these features of claim 15, and *b*) these references are silent on the purposes of Satoh, Ohuchi, and Riding et al., as alleged by the Examiner in the Office Action, i.e., "preventing the occurrence of fractures" (Satoh), "[reducing] warpage" (Ohuchi), and "[reducing] chip outs, cracking and ragged chip edges" (Riding et al.). Office Action, page 6. Therefore, one skilled in the art would NOT be motivated to combine Kobayashi, Yamanaka, and Sumi et al., with Satoh, Ohuchi, and Riding et al., to result in the present invention, as alleged by the Examiner.

Regarding claim 16, Applicants submit that the very fact that Kobayashi fails to teach a moving pattern of push-up needles 31, alleged by the Examiner as corresponding to Applicants' claimed pins, similar to the claimed invention, clearly shows that Kobayashi, one skilled in the art, does not consider it obvious to incorporate the claimed features of claim 16, including, *inter alia*, "wherein . . . a moving speed

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gradually increases and becomes constant thereafter, then decreases gradually to stop, then the pins back to the original position."

At least based on the above rationale, Applicants traverse the Examiner's allegations of obviousness regarding claims 15 and 16. Therefore, Applicants respectfully request that the rejection of claims 15 and 16 under 35 U.S.C. § 103(a) be withdrawn and that these claims be allowed.

Regarding new claims 21 and 22, which depend from claim 13, Applicants submit that these claims are allowable at least because of their dependency from an allowable base claim.

In view of the foregoing remarks, Applicants respectfully request the reconsideration and reexamination of this application and the timely allowance of the pending claims 13-16 and 21-22.

Please grant any extensions of time required to enter this response and charge any additional required fees to our deposit account 06-0916.

Respectfully Submitted,

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